

American Tobacco Company, 1899
Main and Gregson Streets
Durham
Durham County
North Carolina

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

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HISTORIC AMERICAN ENGINEERING RECORD

American Tobacco Company

NC-10

Location: Main and Gregson Streets, Durham, Durham
County, North Carolina.

Date of construction: 1899

Present owner: American Tobacco Company

Significance: The 1890 formation of the American Tobacco Co. led to major changes in tobacco manufacture and trade. Gaining control of the vast majority of American smoking tobacco production, the American Tobacco Co. coordinated local manufacturing plants and processes into a national network of tobacco production. The coordinated operation of the company led to a careful assessment and redesign of, among other things, the storage and aging facilities for smoking tobacco.

Historian: Daniel Bluestone, 1977.

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The 1890 formation of the American Tobacco Company led to major changes in tobacco manufacture and trade. Gaining control of the vast majority of American smoking tobacco production, the American Tobacco Company coordinated local manufacturing plants and processes into a national network of tobacco production. The coordinated operation of the company led to a careful assessment and redesign of, among other things, the storage and aging facilities for smoking tobacco. Prior to 1890, tobacco manufacturers purchased tobacco at auction and had it stored by a warehouse company until it was ready for production. Some warehouses also sold aged tobacco directly to the manufacturer. The capital and plant facilities owned and controlled by American allowed it to store its tobacco and to operate all the machines and equipment necessary to prepare the tobacco for storage. The construction of company owned warehouses helped to guarantee the supply and quality of aged tobacco. [1]

In 1904 the W. Duke, Son & Company branch of the American Tobacco Company constructed the George W. Watts Warehouse on part of 2.51 acres of land purchased from B. L. Duke for \$10.00. [2] The two story 118 x 300 foot brick masonry and heavy timber structure was derived from a prototype developed by American and constructed at the company's plants in Durham and other cities. Upon the 1911 Supreme Court ordered dissolution of the American Tobacco Company, the Watts Warehouse was taken over by the Duke branch of the Liggett & Myers Tobacco Company. It appears likely that Albert F. Hunt, a Richmond, Virginia architect, designed the Watts warehouse, as well as many other company warehouses built around 1900. In October, 1900, the Southern Tobaccoist and Manufacturers Record, describing the construction of an American re-drying plant in South Boston, Virginia, and warehouses in Danville and Richmond, Virginia, stated that Hunt "perfects all their /American Tobacco Company/ plans." [3] Hunt worked as the company's chief architect during this period and in collaboration with company engineers was probably responsible for the redesign and innovations in tobacco storage represented by the Watts warehouse. In January, 1900, Architects and Builders Journal reported, "The American Tobacco Company is having erected an extensive system of storage warehouses under construction from the plans and under the supervision of Albert F. Hunt . . . which will aggregate in cost \$106,500." [4] In July, 1900, Hunt designed two more warehouses costing an additional \$10,000. The warehouses were located in Richmond and South Boston, Virginia; Thomasville and Florence, South Carolina; and Wilson, Winston, and Rocky Mount, North Carolina. [5]

Tobacco is generally aged in storage for two or more years before being processed for smoking. During the 1890s and early 1900s tobacco would be purchased by the company at the tobacco auction. The tobacco was then transported to a nearby re-drying plant where it was prepared for storage. The tremendous increase in American Tobacco Company storage facilities paralleled their purchase and construction of private company re-drying plants. At the

re-drying plant the grades were sorted and held until a sufficient amount for storage was accumulated. In preparation for re-drying, tobacco was hung on sticks or placed on a conveyor fed into the re-drying machine. The machine had three compartments. The high temperature in the first compartment dried the tobacco thoroughly. Room temperature air blown through the second compartment cooled the tobacco. Steam introduced into the third compartment remoistened the tobacco to the level desired for handling and storage.

After passing through the re-drying machine, 900 to 1,100 pounds of tobacco were packed into a cylindrical wooden hogshead. A hydraulic press compressed the tobacco and the head, or end, was nailed shut. At the time the Watts Warehouse was constructed the standard hogshead was 48" high and 48" in diameter. During the two years of storage, cured tobacco continues to undergo a chemical change and fermentation which alters the tobacco's taste and aroma. The most intensive period of aging, "Sweating," occurs during the spring and summer when the latent moisture in the tobacco raises its temperature. The temperature is then lowered with the seasonal drop during the fall and winter. The moisture level of the tobacco during re-drying is determined by the climate fluctuations of the area in which it is stored and thus helps to control the extent of the sweats. [6]

Dryness, ventilation, insect protection, and fire protection are major design considerations in the construction of a tobacco storage warehouse. Water leaks or excessive moisture levels in the warehouse can rot the tobacco. Ventilation is important for controlling and regulating the extent of the sweats. The tremendous value of stored tobacco and the importance of having enough properly aged tobacco for production demanded careful attention to the fire and insect hazards.

As a group, with the Watts Warehouse as a good example, the American Tobacco Company warehouses of the 1890s and early 1900s represented a new design approach to the problems of tobacco storage. Nearly all the major structures added were built of brick because it was far superior to the earlier wood frame warehouses from the standpoint of dryness and insect and fire protection. Agricultural tile laid beneath a cinder and rubble mound foundation fill runs the length of the Watts Warehouse and helps channel moisture away from the building. The slightly pitched roof and drain pipes dump water into a storm sewer beneath the warehouse.

Since the Watts Warehouse was built before mechanical ventilating systems were adopted for tobacco warehouses, the structure is honeycombed with a network of chimneys, flues, vents, and louvered windows. The Watts Warehouse is subdivided by firewalls into four independent houses, 75' x 118'. The 75' walls have four vents on both the first and second floor and the 118' walls have six vents on both floors. The vent openings, 12" x 17.25" x 9", admit air to the flues which connect with the chimneys on the roof. Each chimney is connected with two vent intakes, one on each floor. All the windows in the warehouse are louvered and have tin shutters. The shutters

provided fire protection and could close off air flowing to the windows. The windows and vents insured the proper circulation of air and provided ventilation superior to the old frame warehouses. Subsequent attempts to regulate storage conditions led to the installation of electric fans in the Watts Warehouse and other tobacco storage buildings.

The Watts Warehouse was built when horses and wagons carried the hogsheads between the plant and storage and this determined the close proximity of the warehouse and the plant. The warehouse also stored tobacco shipped to American Tobacco Company plants outside of Durham and thus occupied a site adjacent to the railroad line close to the major freight stations in the center of Durham. The Durham re-drying plant was one of the largest operated by the American Tobacco Company. The rail siding next to the Watts Warehouse and other Durham warehouses was especially important since the Southern Tobacco Journal reported, "The American Tobacco Company is preparing for more storage space in Durham, in fact it is said that the company contemplates making Durham the storage point for leaf tobacco as far as possible." [7] The Durham warehouses constructed around 1900, many in nearly identical style and form as the Watts Warehouse, stored tobacco from the North Carolina leaf markets and then distributed it to plants throughout the country for processing.

The size and layout of the Watts Warehouse was determined by an attempt to reduce fire hazards and to facilitate the efficient handling of hogsheads. In comparison with the total storage area, each of the four 118' x 75' houses in the Watts and other warehouses were relatively small. An 18" fire wall separated the houses. Each year's crop was spread throughout the warehouses in order to reduce the impact of a warehouse fire on one single season's crop. The storage space in each of the four houses is divided by a central aisle running the length of the house. Hogsheads were stacked three high in rows on both floors.

The hogsheads on the floor level row were rolled through double doors at either end of the central aisle, down the aisle, and into the proper row. The hogsheads were rolled as far back to the wall as possible. A cutting stick made of dogwood provided leverage to turn the hogsheads 90 degrees into the separate rows. An Alvro-Clem Elevator Co. open freight elevator located in the middle of the house raised hogsheads to the second floor. A 5 hp Westinghouse Electric Manufacturing Company Type C Induction Motor, running at 1,200 rpm, powered the elevator through a set of belts and pulleys. A worm gear activated by a clutch which moved the belt onto the drive pulleys raised and lowered the elevator. A straight belt moved onto the drive pulley raised the elevator; a second twisted belt moved onto the drive pulley reversed the worm gear and lowered the elevator.

The elevator also played an integral part in stacking the hogsheads. A hogshead would be rolled onto the elevator which was then raised to the height of the second or third stack. The hogshead was then pushed out onto a "low john" or "high john," elevated wagons. Three men pushed the low john

with the hogshhead on top of it to the proper row. The hogshhead was then pushed onto wood tracks, either 2" x 6" or 2" x 8" boards, resting on top of the lower row of hogshheads. The hogshhead was moved down the tracks and dropped into the space created by two adjoining hogshheads in the lower row. The tracks were then withdrawn and placed in front of the next empty space. A high john required four or five men to operate. Two men rode on the side of the high john about four feet off the floor and pushed the hogshhead into the third row stack. Two or three other men pushed the high john between the elevator and the proper row.

The method of stacking one hogshheads inbetween two other hogshheads in the lower row is called nesting. In order to reduce damage to the hogshheads, the tracks were eventually left in place; this method is called dunnage. Hogshheads were removed from the nested configuration by pulling the front hogshheads out of the bottom row and letting the hogshheads in the middle and top two slip forward. Wooden blocks braced the other hogshheads to prevent the entire pile from tumbling forward. The high john and low john were used to unload hogshheads stacked in the dunnage configuration.

Hogshheads on the second floor rested on the wood floor. On the first floor, however, they were placed on top of 4" x 6" wood tracks to prevent the build-up of moisture between the cement floor and the hogshhead.

The narrow individual houses in the Watts Warehouse reduced the amount of ahndling by limiting each row to eight hogs heads between the center aisle and the house walls. When filled to capacity, nine hogshheads could be placed in the rows, but this number obstructed the center aisle. Baled imported tobacco is now stored in the Watts Warehouse. However, when hogshheads were last stored there the capacity of each house was approximately 2,000 hogshheads, a total of 8,000 hogshheads or approximately 8,000,000 pounds of tobacco. This figure is based on a layout placing three rows, three high, in the 16' 6" space between the columns which divide the storage areas on both sides of the central aisle into seven bays. The 2,000 hogshhead capacity figure is based on the Liggett & Myers Tobacco Company's standard hogshhead size, adopted during the 1940s, 54" in length and 48" in diameter. The 1930's Sanborn Insurance Maps list the capacity of the houses in the Watts Warehouses and similar compartments in Yuille, Smith, Hicks, and Toms warehouses at 3,000 hogshheads. [8] This figure could be correct only if four rows of the old style hogshheads (48" x 48") were placed in each bay. Four rows could be placed in each bay leaving less than two inches between the rows. This layout would give a total capacity of 12,000 hogshheads, or 12,000,000 pounds of tobacco.

The Watts Warehouse and ones like it received detailed architectural and ornamental treatment. The brickwork on the chimneys, the dental brickwork around the cornice line, and the pilaster and window details are striking architectural design of the roof's seventy-two chimneys; the ten located on the ends of the firewalls are purely ornamental.

A number of factors undoubtedly contributed to the American Tobacco Company's decision to commission and construct such striking warehouses. Under the public auction system of marketing tobacco, inspection, and storage, warehouses had always tended toward striking architectural compositions. Fine architectural was consciously employed by warehouse operators in order to attract planters and buyers to their establishments. Architecture was one of the more subtle methods of attracting patronage during the late nineteenth century when warehouse operators method's ranged from giving credits, rebates, free transportation to market, "elaborate bunks stables for overnight accommodation," and high pressure advertising. [9] Tilly writes, "many houses were built of wood or later in the period of corrugated iron, although brick was always more desirable. A striking illustration of the prestige inherent in a brick sales house is to be found in the procedure of David Y. Cooper, pioneer warehouseman of Henderson; when replacing his earlier frame structure by a brick one, Cooper invited his friends to contribute a brick." [10]

Durham's social history may have played a part in the architectural treatment of the warehouses. The Duke family, using Durham as a base of operations, became America's largest cigarette manufacturer during the 1880s. James B. Duke began and served as the first president of the American Tobacco Company when the Watts Warehouse and ones similar to it were constructed. The warehouse architecture and Dukes other local philanthropies follow the nineteenth century mill town industrialist's embellishment of self and community through highly visible means. Building the local university, library, hospital, or church contributed to the impression that the millions of dollars accumulated benefited the entire community. A 1903 Durham Daily Sun article indicates the impact of such building projects: "This is the great American Tobacco Company, their home. These people are feeling and taking more interest in Durham than ever before. Look at the ammmoth storage houses they are now building and have built, just think what the Dukes have done for Durham . . . All these people feel a deep interest in Durham and want to make this the greatest tobacco market in the world." [11] The pride taken in the warehouses is indicated by their being named after company officials. George W. Watts was one of the original 1878 partners in W. Duke, Sons & Company.

When taken over by the private tobacco companies, the warehouses with architectural embellishment remained because they still offered advertising advantages in an industry built on successful advertising campaigns. Patrick G. Parter writes, "A significant element in the success of the Duke company was its commitment to advertising as a means of increasing sales." [12] During the 1880s Duke spent about 20% of their sales, \$800,000 in 1889 alone, on advertising. [13] In a climate of stiff competition and heavy advertising any possible commercial advantages which accrued to the public warehousemen by their building designs were apparently adopted in the architectural program of private tobacco company warehouses. Even after detailed brickwork was

replaced by corrugated steel, tobacco companies continued to advertise their storage and aging on billboards next to their facilities: "Six Mills of Tobacco Stored for Making . . . " or "Quiet Tobacco Sleeping for . . . "

The expense of brick construction led to corrugated steel warehouses during the 1920s and 1930s. Instead of windows and vents, the side walls were louvered and flared with screens to protect against insects. The warehouses were moved away from the center city to less expensive land on the outskirts where the possibility of fire was reduced. Motor trucks transported the tobacco from storage to the plant and to the railroad.

The Watts warehouse is typical of storage warehouse design adopted at the turn-of-the-century. The design used and refined previous warehouse designs. The aging of tobacco did not change significantly in subsequent years. The main problems persisted even with increased reliance on mechanical ventilation, chemical fumigation, and mechanical handling of hogsheads with forks lift trucks. The basic design considerations embodied in the American Tobacco Company's 1890 and 1900 studies, and the design for the storage warehouse was one of the first indepth solutions to the problems of tobacco storage. The design met the major problems of tobacco storage and affected the design of modern warehouses. [14]

Footnotes

1. "Heavy Storage of Tobacco," Southern Tobaccoist and Manufacturers Record, 10 March 1903.
2. Durham County Deed Books, Book 29, Page 603, Durham County Courthouse, Durham, North Carolina. Date of Purchase was 11 June 1904. The Southern Tobacco Journal, 35. (20 June 1904): the page number appears to be incorrect in stating that the purchase price was in the neighborhood of \$70,000.00; articles noting additions to Durham Storage facilities appear in Durham Daily Sun, 19 March 1900, 25 March 1903, 19 May 1904, and 30 July 1904.
3. Southern Tobaccoist and Manufacturers Record, 9 October 1900.
4. "Virginia and North Carolina: Interesting Building Notes for Various Plants on these states," Architect and Builders Journal, 1 January 1900: 18-19.
5. Ibid.; "Southern Building Notes," Architects and Builders Journal, 1 (July, 1900): 21.
6. Ben F. Lement, The Tobacco Manufacturing Industry in North Carolina, National Youth Administration of North Carolina, Raleigh, 1939, pp. 14-18; Nannie May Tilley, The Bright-Tobacco Industry, 1860-1929, Chapel Hill, 1948.
7. "More Storage Houses," Southern Tobacco Journal, 35, (20 June 1904): no page number.
8. Sanborn Insurance Map Company, Durham, North Carolina, 1932, 1939.
9. Tilley, Bright-Tobacco Industry, pp. 225-230.
10. Ibid., p. 203.
11. "Warehouse Question," Durham Daily Sun, 24 March 1903.
12. Patrick G. Porter, "Advertising in the Early Cigarette Industry: W. Duke, Son & Company of Durham," North Carolina Historical Review, 48 (January, 1971): 31.
13. Ibid., p. 41.
14. Coy T. Phillip, "Durham, A Geographic Study," Ph.D. dissertation Department of Geology and Geography.

Bibliography

Nannie May Tilléy, The Bright-Tobacco Industry, 1860-1929, Chapel Hill, 1948.

Interviews conducted during August 1977 with, William D. Currin, Vice-President, Manufacturing; Robert D. Hughes, III, Corporate Project Engineer; W. M. Mann, Chief Engineer; C. C. Gurganeus; Superintendent of Blending & Storage; Liggett & Myers Tobacco Company.